STRUCTURAL COMPONENTS/SEALING

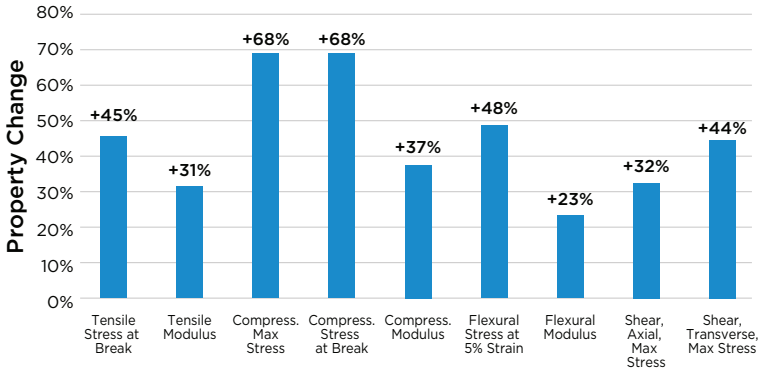
Arlon® 3160XT Glass-filled cross-linked PEEK

High performance material for extreme temperatures

When thermoplastics operate far from their glass transition temperature, rapid degradation of performance could happen depending on the degree of crystallinity. Arlon® 3160XT is a new PEEK polymer specifically developed to retain its performance at very high temperatures, beyond what traditional filled PEEK grades could achieve. This has been accomplished using a unique patented method that Greene Tweed developed to cross-link PEEK materials.

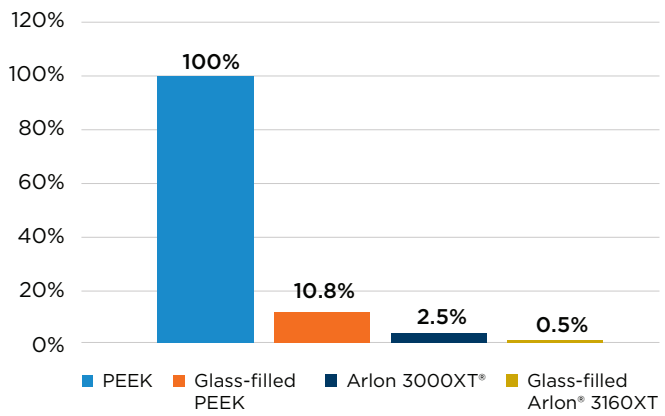
Cross-linking a glass-filled PEEK not only enabled Greene Tweed to significantly improve the mechanical properties of the material at high temperatures, but it also enhanced its chemical resistance, and electrical insulation properties.

High Temperature (260°C/500°F)
Mechanical Property Improvement



Improvement vs Standard Glass-filled PEEK
(Higher is Better)

Compressive Creep, 3 Hours @ 500°F, 35,000 psi
(260°C, 241 MPa) (Lower Is Better)

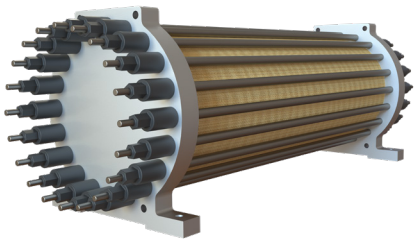


Features and benefits

- Higher glass transition allowing higher effective use temperature (above 260°C based on operating conditions)
- Very good flame resistance
- Higher mechanical properties above Tg
- Exceptional creep resistance (20x better vs. glass-filled PEEK)
- Improved chemical resistance vs. standard PEEK
- Excellent electrical insulation, especially at higher temperatures

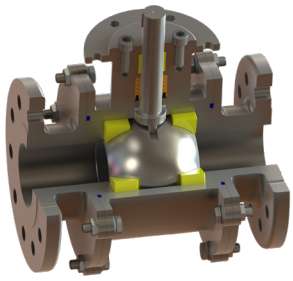
Applications

- **Electrolyser & fuel cell components**
  Directly applicable to applications where bolts, compression is used to assemble products and must remain tight
- **Valve seats**
  Directly applicable to valve seats, where the small size of hydrogen molecules require very high actuation force. Standard glass-filled PEEK may deform under these conditions



Electrolyser & fuel cell components

Valve seats



Arlon® 3160XT Preliminary Datasheet

Designed to provide enhanced high temperature performance in structural and sealing applications

Description	ASTM Method	Units	Standard 30% Glass-filled PEEK	Arlon® 3160XT
Color	—	—	Tan	Black
Specific Gravity	D792	—	1.53	1.51
Shore D Hardness	D2240	—	88	90
Tensile Break Strength	D638	psi	26,000	26,400
Tensile Elastic Modulus	D638	psi	1,700,000	1,580,000
Tensile Modulus (0.5% Secant)	D638	psi	1,720,000	1,590,000
Tensile Elongation	D638	%	2.2	2.5
Flexural Strain at Break	D790	%	2.9	2.8
Flexural Strength at Break	D790	psi	34,100	32,400
Flexural Modulus	D790	psi	1,590,000	1,460,000
Shear Strength, Axial	D732	psi	16,400	16,900
Shear Strength, Transverse	D732	psi	12,700	13,000
Compressive Yield Strength (Max Load)	D695	psi	36,100	37,400
Compressive Strength @ Break	D695	psi	36,100	37,400
Compressive Modulus	D695*	psi	996,000	939,000
Compressive Creep/Extrusion Distance (3hr/72°F, 35,000 psi) Lower is better	ATG ME-0014 (Custom Test)	in	0.0003	0.0000
Impact Strength, Unnotched	D4812	ft-lb/in	20	16
Impact Strength, Notched	D256	ft-lb/in	1.7	1

High Temperature Properties

Description	ASTM Method	Units	Standard 30% Glass-filled PEEK	Arlon® 3160XT	Improvement vs Standard Glass-filled PEEK
Tensile Break Strength (500°F)	D638	psi	7,600	11,000	+45%
Tensile Elastic Modulus (500°F)	D638	psi	519,000	680,000	+31%
Tensile Elongation (500°F)	D638	%	6.0	4.8	-20%
Flexural Strength at 5% Strain (500°F)	D790	psi	11,200	16,500	+47%
Flexural Modulus (500°F)	D790	psi	446,000	540,000	+21%
Shear Strength, Axial (500°F)	D732	psi	5,690	7,650	+34%
Shear Strength, Transverse (500°F)	D732	psi	3,930	5,600	+44%
Compressive Yield Strength (Max Load) (500°F)	D695	psi	7,040	11,800	+68%
Compressive Strength @ Break (500°F)	D695	psi	7,020	11,800	+68%
Compressive Modulus (500°F)	D695	psi	253,000	346,000	+37%
Compressive Strain at Break (500°F)	D695	%	5.0	5.9	+18%
Compressive Creep/Extrusion Distance (3hr/500°F, 35,000 psi) Lower is better	ATGME-0014 (Custom Test)	in	0.0140	0.0007	20X better extrusion resistance